ECONOMICS

LESSON 5

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ECONOMICS

LESSON V.

The Manufacturer

THOSE who have carefully studied the preceding lessons cannot have failed to be impressed with the great difference between our methods of production and those of our ancestors. We have noted these advances in the case of agriculture—the change from the scythe to the reaper, from the hoe to the cultivator, from the hand-rake to the horse-rake—from less efficient to more efficient methods of production, involving the division of labour and increasing specialization. This change, we have seen, has, by its widespread and far-reaching consequences, deserved the name by which it is sometimes called—the "agricultural revolution."

Greater even than the agricultural is the industrial revolution—the supersession of the old domestic system by the factory system of industry in what we call manufactures. That word itself gives us a clue to the nature of the change. It comes from the Latin words, *manus*, a hand, and *facere*, to make. It means, therefore, "to make with one's hands," and any person who made articles by the labour of his hands was called a "manufacturer" in the original sense of the words, while his workshop might be called a "manufactory," a word which has been abbreviated into "factory."

Our modern manufacturer, however, does not work with his hands. He has machines to do it for him, and employees to tend the machines. He himself works with his head rather than with his hands. Again, when we speak of a "factory" we do not mean what men originally meant—a little shop, whose owner works there with his hands. We think of a great shop, with belts and machinery, or possibly electric motors, whizzing continually, and with a considerable number of people busily engaged in these shops for so many hours every day.

What is a Factory?

There has been some dispute about which is the more fundamental idea in the word "factory," as we apply it to-day. Would the concourse of wage-earners working each man with his own hand-power, constitute a factory if there were no machinery at all, no engines, no belts, no motive power? For example, is a place where men co-operate in painting buggies by hand a factory? The best authorities say it is; but whether such a place may be included or not, the typical factory suggested to our minds by the word is one where some motive force—water, steam, or electricity—is continuously used in manufacture. In most cases, indeed, it is the location of this motive power in some certain place which has made it expedient for wage-earners to come together there from all points of the compass to secure work that they could not secure at home. Mr. Carroll D. Wright, in his well-known Report on the Factory System of the United States, gives the following definition:

"A factory is an establishment where several workmen are collected for the purpose of obtaining greater and cheaper conveniences for labor than they could procure individually at their homes; for producing results by their combined efforts which they could not accomplish separately; and for preventing the loss occasioned by carrying articles from place to place during the several processes necessary to complete their manufacture. The principle of a factory is that each laborer, working separately, is controlled by some associating principle which directs his producing powers to effect a common result which it is the object of all collectively to attain. Factories are therefore the legitimate outgrowth of the universal tendency to association which is inherent in our nature, and by the development of which all industrial success has been gained; and from this principle springs the necessity for subdivision of labor, without which the factory system would have met with but feeble growth. The more the principle of association appears prominent in any species of production, the more

rigidly does it become entitled to the name of factory, and the more generally does it receive the name in common parlance."

In manufacture, just as in agriculture, great increase in production arises from the division of labour, independent of anything else. That division of labour is best attained where men who perform different operations upon the same article are working in the same workshop; also, there is less loss of time than if each man performed this operation in his own cottage, as he might conceivably have done.

These are, nevertheless, minor advantages as compared with that of having the powers of nature—water-power, steam-power, or electric-power—harnessed at a certain place to do your bidding. It was indeed Watts' invention of the steam-engine which gave the death-blow to the old system of producing manufactured goods, of weaving, spinning, etc., in the worker's own house—the domestic system as it was called—and inaugurated the industrial or factory system as we understand that word to-day.

To us to-day the mechanical marvels which spring from man's control over the powers of nature are an old story, and we find it difficult to work up any great enthusiasm over labour-saving machinery. We cannot realize how wonderful the steam railway seemed to the contemporaries of George Stephenson, or the power loom to the men who witnessed its introduction. Yet the effect of such inventions in the different societies where they have been successfully introduced is simply incalculable. Britain, where they first came into use, owes her triumph over her great enemy in the Napoleonic war even more to her machine industry than to the victories of Nelson and Wellington. The great prosperity proceeding from her unprecedented rate of production enabled her to finance the most expensive war in the history of the world.

The Industrial Revolution

The industrial revolution began in England in the latter half of the eighteenth century with inventions which com-

pletely changed the character of the woollen and cotton trades. Spinning was the general employment of unmarried girls who, even to-day, are in law described as spinsters. These girls were unable to spin enough yarn for the weavers, and when John Hargreaves invented the spinning-jenny, by which one spinner could spin many threads at a time, it gave a great stimulus to weaving by providing an almost unlimited supply of raw material. Richard Arkwright also invented a water-power frame for spinning, and Edmund Cartwright, a clergyman, invented the power-loom. The utility of these various machines was enormously increased by James Watts' steam-engine, which was soon applied to the work of running them. (Cartwright at first used a bull to operate his power-loom, but after a time he set up a steam-engine.) Gradually—more gradually than would be the case now—the new machines came into general use, and greatly decreased the cost of producing cotton and woollen cloth. The competition of the machines proved most disastrous to the handworkers, who were driven to starvation and pauperism.

Industrial Supremacy of England

In spite of all this, the introduction of the new machinery marked an enormous advance in national prosperity. It gave the British people a tremendous advantage over those of other countries. The English machine-worker could make far more of a given product in a given time than a Continental hand-worker, and although he got higher wages, his wages were less per unit of product, so that he was cheaper to his employer. Thus the English manufacturer could sell his goods on the Continent for less than the price at which the Continental producer could compete. This English monopoly of machine production went on for a generation at least, and as a consequence of it all, we have the Continental nations crying out for protection against the cheap wares of England; and yet those wares were produced by workmen who were much better off than their own.

Here is a German tribute, written in 1805, to the commercial supremacy of England: "A nation that by her activity and the genius of her citizens, manufactures its numberless articles of merchandise, infinitely finer, in much superior workmanship, in far more exquisite goodness, than all other nations, without exception; and that is able to sell them infinitely cheaper, owing to her admirable engines, her machines, and her native coal; a nation, whose credit and whose capital is so immense as that of England; surely such a nation must render all foreigners tributary; and her very enemies must help to bear the immense burthen of her debt and the enormous accumulation of her taxes."

The unsettled state of the Continent of Europe during the Napoleonic wars made it inadvisable for the capitalists of that period to invest their money in buildings and factories which might at any moment be destroyed by contending armies. Indeed, the forced contributions levied by Napoleon upon his own and other nations absorbed the greater part of the savings of that period. England thus achieved a commercial and manufacturing supremacy which was for some time unchallenged. By the end of the wars, her manufacturers had acquired a connection and a supremacy which made it very difficult for the manufacturers who, after 1815, began to build factories in other countries, to compete with the English. But, as happens in the political life of nations, predominance provokes jealousy and attack. The other leading nations of the world felt themselves too much at the mercy of England, and therefore they began to encourage native manufactures by bounties and import duties, just as we in Canada are encouraging our manufactures by these methods to-day. This policy has been pursued most deliberately by Germany, at first through the Zollverein or Customs Union of the separated German States, and later through the Imperial Government, and by the United States.

In both these countries, as well as in most others, we find the governments placing a more or less heavy duty on the

importation of foreign manufactured goods. Their aim was to encourage native producers to set up in business for themselves, and to give them financial aid, either directly by bounties or indirectly by customs duties, until they had accumulated large capital and were able to compete on even terms with the long-established British manufacturers of these articles. In the meantime the people of the protecting country who were not engaged in these industries were paying higher prices than was really necessary in order to help the producer of these goods. This policy may have been worth while, but certainly the consumer has had to pay for it. It is possible, however, that when the protected industries finally become established and their protection is removed, they may be able to sell to their consumers cheaper than foreign producers could, since they will then be able to produce as cheaply as their foreign competitors, while their cost of transportation will be less. Thus the consuming class may in the end be compensated for the burdens placed upon it. This, we trust, will yet be the case in Canada.

Protection in Canada

Up to 1846, when by the repeal of the Corn Laws, the British Government removed the preference which she had given to Canadian grain, English manufacturers received a preference in the Canadian markets, and it was virtually impossible for Canadians, on account of the scarcity and dearness of skilled labour, to compete with them in producing manufactured goods. The grant of responsible government to Canada, however, and the withdrawal of the preferential treatment formerly extended to this country logically involved the further principle that Canadians should control their own market and be free to make their own tariff, and in 1847 Canada adopted a budget which abolished all preferences to British products as compared with foreign. This tariff was for revenue only, but on the initiative of Canadians who felt that if a fair start could once be obtained their country's manufactures would soon

become firmly established, a protective tariff was enacted in 1858. Against this the English manufacturers protested to the Secretary for the Colonies who, after some consideration, declined to interfere, on the ground that Canada was a self-governing colony. Thus a very important principle was recognized, which was still more firmly established by Section 91 of the British North America Act. This gave the Dominion Parliament exclusive legislative authority in all matters relating to "the regulation of trade and commerce," "the raising of money by any mode or system of taxation," and "navigation and shipping."

From 1858 to the present time, the principle of protection to the native manufacturer has to a greater or less extent obtained in all Canadian tariffs by whomsoever enacted. Before Confederation the tariffs of the Maritime Provinces were levied mainly with an eye to revenue (in Nova Scotia the average rate was 10 per cent., in Prince Edward Island 11 per cent., in New Brunswick 12 1-2 per cent.). Confederation involved free trade among the four provinces of the then Dominion, and we have what Prof. McLean, in his "Tariff History of Canada," calls a 15 per cent. tariff from 1867 to 1874, followed by a 17 1-2 per cent. tariff from 1874 to 1878. This rate was raised to a 20 per cent. tariff (the National Policy tariff) from 1878 to 1890. From that latter date there was a tendency to tariff reduction evident in the last years of the Conservative Government, due to the increasing restiveness of the people in a period of hard times under a tariff which had a tendency to increase prices at a period when it was difficult for the average citizen to make ends meet. This restiveness was partially allayed by the British preferential tariff, enacted by the Laurier Government in 1897; it has of late been once more increasing, especially in the West.

With regard to the expediency of this protective policy, from the point of view of the country at large, the greatest differences of opinion exist, even among those who may be considered authorities on the subject. There can, however, be but little doubt that in Canada, as in other countries,

protection has been a great factor in upbuilding many important industries. We shall now trace the history of Canadian manufactures in general and certain representative industries in detail.

The Rise of Canadian Manufactures

When one looks back once more to the Canada of 1850, one finds it very different indeed from the Canada of to-day. Its towns were few and of second-rate importance, composed largely of government servants and commercial people—people concerned in the marketing of the primary products of the farm, the forest and the fisheries. There were few, very few, of the tall chimneys which are everywhere to be seen in the modern city. In fact, the Eastern towns, where the chief manufactures of the country are now carried on, were in this particular at least like the young Western towns of to-day, where manufactures have as yet had no time to become established—where the demand for the finer kinds of manufactured goods is supplied by bringing in goods from the East rather than by production on the spot. Into these small towns all fine manufactured goods were imported, principally from England, whose goods naturally enjoyed a preference in the colonies in return for the preference which she extended to their raw materials and food products—for example, to Canadian wheat and timber. The manufactures of the United States, still in their infancy, and handicapped by this preference given to British goods, found but little sale in Canada.

England, then, supplied us in the main with our finer manufactures down to about the year 1850, which we may, with Mr. Stapleton Caldecott, consider as the turning-point in our industrial history. There were some things with which England was not in a position to supply us, because she did not make them herself. In England, for instance, labour was so much cheaper than in Canada that the problem of securing men to cultivate their farms did not worry Englishmen as it did Canadians. Accordingly, we do not find in England the demand for agricultural implements

that exists with us in a country where labour is harder to procure. England did not feel the need of machinery in her small area with many hands; therefore, she did not trouble herself greatly about agricultural implements, and did not produce them. But Canadians, in a large country with few hands, wanted to get as much labour done as possible, and found it necessary to produce for themselves. Thus, finally, a great implement industry was created, and our country to-day exports much more than she imports of these valuable machines.

We have already dealt with agricultural implements in so far as their influence on the farm was concerned. Now let us look at them a moment to consider the great industry which arose out of their manufacture.

The Agricultural Implement Industry

The agricultural implement industry in Canada is inseparably connected with the name of Hart A. Massey. His father, a prosperous farmer in Northumberland County, Ontario, imported in 1830 one of the first threshers ever seen in Canada, and afterwards imported other agricultural machinery. Feeling that there was a general need of such implements, he resolved to begin their manufacture. In 1847 he established a small foundry and repair-shop at Newcastle. In 1852 the firm, now H. A. Massey & Co., began to turn out the first mowers and reapers ever produced in Canada. As time went on, other farm implements were added to the list. In 1861 the manufacture of Wood's mower was begun, and in 1863 Wood's self-rake reaper made its appearance. The latter machine obtained the gold medal at the Paris Exposition of 1867. In 1878 the Massey harvester was produced. In the following year the works were moved to Toronto, where abundant labour was available, and better shipping facilities existed.

While this was going on, many other small foundries arose to supply the local demand in various towns throughout the country. These had an extraordinary run of prosperity for some time, and often received bonuses from the

municipalities in which they were located. Begun, however, for the most part by men who were good mechanics rather than competent business men, these concerns were unable to meet the pressure of the hard times which followed in the seventies and nineties, especially as their capital was very small. Their sales were largely on credit, and when the price of wheat fell, the farmers whose notes they held were in many cases unable to meet their obligations, and thus these industries were themselves pushed to the wall. Hard times, again, meant a contracting market for their product, and in that contracting market the large firm with considerable capital, with business connection and great ability in the management, by an economic law as inevitable as the tides, necessarily drove its competitors out of existence. Some Ontario municipalities are still mourning the money which they sank in an attempt to bolster up their local implement industries.

In competition of this kind, events usually take the following course: The weaker firms go to the wall, and those of approximately equal strength who find themselves unable to supplant each other, agree to combine their forces in order to put a stop to ruinous competition and to secure the greatest possible benefit for themselves. This is just what inevitably happened to the Masseys in their relations with other strong and progressive firms. In 1891 the Massey Manufacturing Co., Messrs. A. Harris, Son & Co., Ltd., of Brantford, and Massey & Co., Ltd., of Winnipeg, were amalgamated into one company, with a capital of $5,000,000, under the name of the Massey-Harris Co., Ltd. At the present time the great American organization, the International Harvester Co., is trying to secure a share of the Canadian market by establishing a branch at Hamilton.

The Iron and Steel Industry

One industry frequently gives rise to another. Agricultural implements require iron and steel in their composition, and consequently we have the encouragement of an iron and steel industry in Canada. Also, the demand for

iron and steel in the construction of railways, in ship-building, in the erection of large buildings, has brought it about that this age is sometimes called the "iron age" of the world's history. The "iron trade" is in Great Britain and the United States regarded as the barometer of industrial prosperity. The iron and steel trade is known as the "basic industry."

It was, then, natural that our people in Canada should want to produce their own iron and steel, in order to make their agricultural implements, to build their railways, and to construct their great office buildings. This was made possible by the existence of immense and valuable deposits of magnificent ore, especially in the St. Maurice district of Quebec, where a forge was set up by the French Government as early as 1737, as well as in Nova Scotia. For a long time, however, the great bulk of iron and steel used in this country was made in the United States by the great American steel mills of Pennsylvania. In 1887 an import duty of four dollars a ton was placed on pig-iron, with encouraging results; ten years later a bounty of at first two dollars a ton was paid for home-produced pig-iron. Under this bounty the quantity of pig-iron produced increased from 33,000 tons in 1897 to 740,000 tons in 1910, while the steel production in the latter year was 740,000 tons, as compared with 8,700 tons in 1897.* About $100,000,000 has been invested in the industry. While there has been great expansion in the past fifteen years, the increase in the use of steel has proceeded still more rapidly, so that the home product supplies only about one-half the needs of the country.

The Textile Industry

As early as 1842 the then Province of Canada was importing annually nearly $2,000,000 worth of cotton goods and $1,500,000 worth of woollen goods from Great Britain.

*Details as to these bounties and the annual production of pig iron and steel are to be found on page 436 of the Canada Year Book for 1910. The total bounties paid from 1896 to 1910 amounted to $6,835,000 for pig iron and $6,356,000 for steel.

The woollens no doubt were the finer kind of goods, the Sunday suits which supplemented the homespun worn every day by the average inhabitant of the Province. Canada had at that time little prospect of establishing a cotton manufacture, since the source of supply of raw cotton—the Southern States—was far away, with no means of communication and with no established business connections. The case of wool, however, was different. Canada produced considerable wool; she made homespun of it. With machinery and a few skilled workmen and perhaps a little encouragement from the government, there was no reason at all why a flourishing woollen industry should not be built up, and the cost of transporting these goods from Great Britain saved.

Already, in 1842, machinery was in use to some extent; Upper Canada had 186 carding mills and 144 fulling mills; in 1844 Lower Canada had 169 carding mills and 153 fulling mills. In 1851 there were 385 carding and fulling mills in Canada and the Maritime Provinces.

The first power-loom in Canada of which we have record was introduced in 1837 at a small factory at Chambly, Quebec. In Ontario the factory system of woollen manufacturing was instituted by Barber Bros., of West Flamboro, who, after operating a paper and woollen mill at that village for some years, moved to Georgetown, where they purchased a small mill. Later on they moved to Streetsville, where they conducted a business on a larger scale, producing tweeds, shirtings, flannels and kidderminster carpets. In 1862 their mill had 2,000 spindles, employed 90 hands, with a monthly wage bill of $1,600, and produced 18,954 yards of cloth in August of that year.

Other mills soon sprang up. Frasher & Crathaws, established at Cobourg in 1849, had in 1862 45 looms, producing 800 yards of cloth a day. Andrew Paton in 1855 established a woollen mill in Galt, and in 1866 one in Sherbrooke. Mills began operations at Carleton Place in 1847 and at Almonte in 1857.

In 1871 there were in Canada 270 establishments for the

manufacture of woollen goods, with annual wages of nearly $1,000,000 and a product of $5,500,000. In 1891 there were 377 woollen mills with 7,156 hands, wages of $1,884,000, and products of over $8,000,000. Owing largely to the fact that the later censuses do not include establishments with less than five hands, the statistics of the census of 1901 and the special manufacturers' census of 1906 are not comparable with the foregoing. An article on the woollen industry, published in Industrial Canada in 1905 estimates the number of wage-earners at 13,000 and the product (in 1901) at $11,425,000.

The cotton manufacture began at nearly the same time as the woollen. The first mill was established at Sherbrooke about 1844, and deserves notice as the first limited liability company in Canada. Others were established at Thorold in 1847, at Montreal in 1853, at St. John, New Brunswick, in 1861, and at Dundas in the same year. These five mills had increased to eight in 1871, with a product of $781,000; to 19 in 1881, with a product of $3,759,000; to 23 in 1891, with a product of $8,741,000; to 20 in 1901, with a product of $12,033,000; to 20 in 1906, with a product of $14,223,000. Of this amount, $7,924,000, or 55 per cent., was produced in Quebec. Thus, the cotton industry of Canada has increased twenty-fold since 1871. The relatively small increase in the number of mills, as compared with the enormour increase in the product, is an instance of an almost universal tendency to the concentration of business in a few large enterprises.

The Boot and Shoe Industry

The boot and shoe industry is also of considerable importance in the history of Canadian manufactures. The first factory of which we have knowledge was established in Montreal in 1828, and between 1840 and 1850 we have records of some half-a-dozen founded in Lower Canada. In 1847 Brown & Childs, the leading manufacturers of that time began the use of machinery by importing several Singer sewing-machines to put together the uppers of

boots. As usually happens when new machinery is introduced, this action roused considerable dissatisfaction among employees who found themselves thrown out of work by this labour-saving invention, and the firm in question became so obnoxious to the populace that it was only by a considerable military force that the mob which burned the Parliament buildings in 1849 were prevented from burning the offending factory. In 1860 the McKay machine for the sewing of soles was imported by Scholes & Ames, also of Montreal. Since that time the use of machinery has become more and more common, and new machinery has from time to time been invented, which has increased the product with perhaps an actual diminution of labourers. This industry, like the cotton industry, employs very largely French-Canadians, and in 1906, 77 of the 138 establishments in Canada were situated in the Province of Quebec. These had a product of $13,705,000 out of a total for the Dominion of $20,264,000, or over two-thirds.

Summary of Canadian Manufactures

The foregoing are only a few of the leading industries, but their growth will serve to show the great development of manufactures in Canada during the past half-century, with the introduction of machinery and a favouring tariff.

That growth may be briefly summarized as follows:

Value of product,	1871	$221,617,000
	1881	309,676,000
	1891	469,847,000
	*1901	481,053,000
	*1906	718,352.000
(Estimated)	1911	1,200,000,000

This result is sufficiently wonderful when we consider what great manufacturing industries have arisen from such small beginnings in the past fifty years. The student will

*The small increase between 1891 and 1901 is due to the fact that the enumerators in the former year included all industrial establishments, while in the latter they included only those employing five or more persons.

note the exceedingly rapid increase of the past ten years. Unfortunately, the results of the 1911 census are not at the present date available, but there is little doubt that the figure quoted above from the Canadian Manufacturer's estimate are quite justified.

Survivals of the Domestic System

While this enormous growth has taken place among the great industries of the country, it must not be concluded that the old domestic system of manufacture is dead. It survives in many forms and in many places. The small cobblers of our towns, the blacksmith shops of the country, the repair shops for machinery, are all remnants which have survived from the past, and now, as it were, feed upon the crumbs which fall from the manufacturer's table—mending machine-made shoes instead of making shoes to order (as is still done to some extent in England), repairing machine-made agricultural implements, bicycles and automobiles. In some cases where special skill of an artistic character is required, as in the production of hand-made lace, the domestic industry still holds its own against the factory system, as the individual character of the hand-made article appeals to the wealthy consumer much more than the uniform machine-made product. The difference in the excellence of the two methods can be well illustrated from the printing industry, where the type-setting machine has superseded the old hand compositors only within the past twenty years. The solid, uniform reading matter of our newspapers and some of our books is now set by machines with keyboards resembling those of typewriters, but the artistic advertisements seen in our magazines are all "set up" by hand labour, since they involve some artistic skill on the part of the compositor. Thus it appears that there is still some place for the domestic or hand system of industry in our modern civilization in producing goods of peculiar quality demanded by a certain section of the public. By a curious paradox, the very public whose wealth has flowed in largely through the channels of

machine industry has acquired an increasingly fastidious taste for the individualised artistic hand-made products. Nevertheless, while there will always be a limited field of this kind for the domestic industry, the great and increasing bulk of industry will more and more be performed by machines.

N.B.—The Canada Year Book of 1907 gives a valuable résumé of the statistics of Canadian manufactures from 1871 to 1906. (Pp. 124-155.) The Year Book of 1910 gives detailed statistics for 1906. (Pp. 36-50.) Industrial Canada, the organ of the Canadian Manufacturers' Association, publishes from time to time interesting and valuable articles on the growth of manufactures of various kinds.

EXAMINATION QUESTIONS

ECONOMICS.

LESSON 5.

1. What do we mean by the "industrial revolution?"

2. What is a factory? Why do people gather together there to produce commodities?

3. Give examples of labour-saving machines, and show how labour is saved by their use.

4. What were (1) the immediate, and (2) the ultimate consequences of labour-saving inventions to the wage-earning classes?

5. Describe the industrial situation of Europe at the beginning of the nineteenth century. What causes led to the establishment of the German and American tariff systems?

6. Under what circumstances did Canada get the right to make her own tariff? What general fluctuations have there been in it?

7. What causes led to the establishment of an agricultural implement industry in Canada? Trace its rise and the gradual concentration of production in the hands of a few firms.

8. What causes would you suggest for the growth of the iron and steel industry of Canada?

9. Trace the growth of the textile industry in Canada, using any information upon the subject you can secure from local sources.

10. Trace the rise of the boot and shoe industry. Why do the boot and shoe and the cotton industries appear to flourish most in French Canada?

11. In what type of industries does the domestic system still hold its ground? Give illustrations.

12. Give an account of the rise of any local manufacture (for example, the cement industry) not mentioned in the lesson.